

## Claims

[c1] What is claimed is:

1.A printing method using a thermal print head having a plurality of heaters linearly arranged and equally spaced for heating a dye and transferring the dye onto an object, thereby forming a plurality of pixels corresponding to the heaters on the object, a color of each pixel being determined by a gray level, each gray level comprising a first portion and a second portion, wherein when controlling the heater to generate a pixel of a predetermined gray level, the printing method comprises:

activating a heater for a number of cycles corresponding to the first portion of the predetermined gray level, thereby transferring the dye onto the object in a position corresponding to the heater, wherein the first portion is larger than or equal to zero, each cycle lasts a substantially equal amount of time, each activation of the heater within a cycle lasts a substantially equal amount of time, and quantity of the dye transferred onto the object is substantially equal for each activation of the heater; and

deactivating the heater for a first predetermined number of cycles corresponding to the second portion of the predetermined gray level, then activating the heater a second predetermined number of cycles corresponding to the second portion of the predetermined gray level, wherein both the first predetermined number and the second predetermined number are integers larger than or equal to 1, a total quantity of the dye transferred onto the object in printing the second portion of the predetermined gray level is less than the quantity of dye transferred onto the object during each cycle of printing in first portion of the predetermined gray level.

[c2] 2.The printing method of claim 1 wherein the second portion of the predetermined gray level is printed after the first portion of the predetermined gray level has finished.

[c3] 3.The printing method of claim 1 wherein before the thermal print head prints the first portion of the predetermined gray level for any of the pixels, the printing method further comprises:  
activating each of the heaters simultaneously for a second predetermined

*is the  
1st*

period, causing the heaters of the thermal print head to reach a predetermined temperature.

[c4] 4.The printing method of claim 1 wherein the thermal print head is arranged in a printer, and the printer further comprises a fixture for fixing and moving the object whereby the thermal print head transfers a pattern onto the object.

[c5] 5.The printing method of claim 4 wherein the printer is a photo printer, the dye is carried on a ribbon, and the object is a photo paper.

[c6] 6.The printing method of claim 1 wherein the thermal print head is moveably arranged in a printer, and the printer further comprises a fixture for fixing the object, and the thermal print head transfers a pattern onto the object one line at a time.

[c7] 7.The printing method of claim 1 wherein a sum of the number of cycles for activating the heater according to the first portion, the first predetermined number of cycles for deactivating the heater according to the second portion , and the second predetermined number of cycles for activating the heater according to the second portion is less than a total number of different gray levels.

[c8] 8.The printing method of claim 1 wherein if the number of cycles for activating the heater according to the first portion is increased, an amount of the dye transferred onto the object is increased for raising the corresponding gray level.

[c9] 9.A printer comprising:  
a fixture for fixing an object; and  
a thermal print head comprising a plurality of heaters linearly arranged and equally space for heating a dye so as to transfer the dye onto the object;  
wherein the thermal print head forms a plurality of pixels on the object corresponding to the heaters, a color of each pixel is determined by a gray level resolution, each gray level comprising a first portion and a second portion, wherein when the printer controls the heater to generate a pixel of a predetermined gray level, the thermal print head activates a heater repeatedly in a number of cycles corresponding to the first portion of the predetermined gray

level, thereby transferring the dye onto the object in a position corresponding to the heater, wherein the first portion is larger than or equal to zero, each cycle lasts a substantially equal amount of time, each activation of the heater within a cycle lasts a substantially equal amount of time, and <sup>a</sup>quantity of the dye transferred onto the object is substantially equal for each activation of the heater, and then the thermal print head deactivates the heater for a first predetermined number of cycles according to the second portion of the predetermined gray level, and thereafter activates the heaters a second predetermined number of cycles, both the first predetermined number and the second predetermined number are integers larger than or equal to 1, a total quantity of the dye transferred onto the object in printing the second portion of the predetermined gray level is less than the quantity of the dye transferred onto the object during each cycle of printing in the first portion of the predetermined gray level.

[c10] 10. The printer of claim 9, wherein before the thermal print head prints the first portion of the predetermined gray level for any of the pixels, the thermal print head turns on each of the heaters simultaneously <sup>for</sup> a second predetermined period, causing the heaters of the thermal print head reach a predetermined temperature.

[c11] 11. The printer of claim 9, wherein the fixture moves the object so that the thermal print head transfers a pattern onto the object.

[c12] 12. The printer of claim 11 is a photo printer, the dye is carried on a ribbon, and the object is a photo paper.

[c13] 13. The printer of claim 9, wherein the thermal print head is moveably arranged in the printer, and the thermal print head transfers a pattern onto the object one line at a time.

[c14] 14. The printer of claim 9 wherein a sum of the number of cycles for activating the heater according to the first portion, the first predetermined number of cycles for deactivating the heater according to the second portion, and the second predetermined number of cycles for activating the heater according to

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the second portion is less than a total number of different gray levels.

[c15]

15. The printer of claim 9 wherein if the number of cycles for activating the heater according to the first portion is increased, an amount of the dye transferred onto the object is increased for raising the corresponding gray level.

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